



Survey of Research and Experimental Development Businesses 2003-04

RD 101L

In correspondence, please quote this number ▼

Australian Business Number

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Please contact
errors

Purpose of Collection

The Research and Experimental Development (R&D) surveys provide comprehensive data on Australia's R&D effort and are used by government and advisers to government, international organisations such as the Organisation for Economic Co-operation and Development, businesses, economists and others.

Collection Authority

The information asked for is collected under the authority of the *Census and Statistics Act 1905*. Your co-operation is sought in completing and returning this form by the due date. The Act provides me with the power, if needed, to direct you to provide the information sought.



Confidentiality

Your completed form remains confidential to the Australian Bureau of Statistics.

Due Date

Please complete this form and return it in the reply paid envelope to the Australian Bureau of Statistics by **5 November 2004**.

Help Available

If you have problems in completing this form, or feel that you may have difficulties meeting the due date, please contact the Australian Bureau of Statistics by:

Telephone

1800 818 909
(Freecall)

Facsimile

1300 303 813

Mail

Reply Paid 76746
Sydney NSW 2000

Dennis Trewin
Australian Statistician

Person we should contact if any queries arise regarding this form

Name		Telephone Number					
Position or Title		Facsimile Number					
Signature		Date		/	/		

Please read this first

Important: This form will be read using electronic equipment.

- Use **black** pen when completing this form.
- Keep each number or tick within the data entry boxes provided, for example

or

- Leave answer boxes blank where you have no response or data to enter, for example

- Do not use 'nil', 'n/a' or '-'
- Information reported on this form should comply with Australian accounting standards.
- Report on an accruals basis as recorded in this business's Statement of Financial Performance and Statement of Financial Position.

- Only the Australian-based activities (including imports and exports) of the business shown on the label should be included on this form. Include details of the business's participation in any unincorporated joint ventures.
- Report all expense items **exclusive of Goods and Services Tax (GST)** which are recoverable as an input tax credit.
- If exact figures are not available, please provide careful estimates.
- Please report all monetary values in **thousands of dollars** (\$,000). For example, report \$20,000 as 20. Where the value in this business's accounts is not expressed in thousands of dollars, round the value up or down to the nearest thousand dollars.
- The items listed under **Including** and **Excluding** are examples and should not be taken as a complete list of items to be included or excluded.

- Part 1 – General Information
- Part 2 – R&D carried out by this business
 - Human resources and financial information
- Part 3 – Classification of research
- Part 4 – Expected expenditure
- Part 5 – Biotechnology R&D
 - Financial information
 - Location and distribution of activity
 - Adverse factors
- Part 6 – Time taken and comments

Definitions

What is business Research and Experimental Development (R&D)?

The R&D performed by businesses is generally investigative work which is of actual or potential use in the development of new or enhanced materials, products, devices, processes or services. R&D directed towards duplicating work already developed by others should only be included if the knowledge or technology required for development is not available to this business.

Examples of R&D

- Design, construction and operation of prototypes where the main objective is technical testing or to make further improvements
- Construction and operation of pilot plants not operated or intended to be operated as commercial units
- Research and development of new computer software or substantial modifications to existing computer software. This includes developments which lead to technological or scientific advances in:
 - theoretical computer sciences
 - operating systems e.g.:
 - improvement in resource or interface management, a truly new operating system or the conversion of an operating system to a **significantly** different hardware environment
 - programming languages e.g.:
 - new languages, **significant** extension of an existing language or new or **significantly** different language translator
 - applications if a **significant** technological standard is achieved
- ‘Feedback R&D’ directed at solving problems occurring beyond the original R&D phase. For example technical problems arising during initial production runs
- Research work in the social sciences and humanities
- R&D into, or utilising, technology such as:
 - bioinformatics
 - genetic modification
 - marker assisted selection

R&D activities that are not used primarily for the support of, or a part of, R&D projects)

- Scientific and technical information services
- Policy related studies, management studies, efficiency studies
- Consumer surveys, advertising, market research
- Routine quality control and testing
- Pre-production activities such as demonstration of commercial viability, tooling up and trial production runs

- Prospecting, exploring or drilling for minerals, petroleum or natural gas
- Cosmetic modifications or style changes to existing products
- General purpose or routine data collection
- Routine computer program updates maintenance or software applications
- Operations research and mathematical or statistical analysis
- Commercial, legal and administrative aspects of patenting, consulting or licensing activities
- Activities associated with standards compliance
- Specialised routine medical care, for example routine pathology service

Where does R&D end?

R&D ends when the work is no longer experimental and pre-production begins.

If the primary objective is to make further technical improvements then the work comes within the definition of R&D.

However, if the material, product etc. is substantially developed and the primary objective is to develop markets, to do pre-production planning or to get production or control systems working smoothly, then the work is no longer considered to be R&D.

Differences from the Tax Concession Scheme and competitive grants for industry R&D

In terms of definition and scope, the ABS survey of business R&D is different to both schemes. The main differences of the ABS survey are:

- the collection of data on R&D performed by all types of businesses irrespective of the amount of R&D expenditure and the source of R&D funding
- the collection of computer software irrespective of its development for own use or multiple sale
- the inclusion of nonspecific R&D expenditure that is indirectly attributable to R&D, such as a proportion of general overhead expenditure
- the inclusion of research into the social sciences, arts and humanities

5 Period covered by this form

Note

- This form is for the financial year ended **30 June 2004**.
- If this business has a different financial year, please report for a 12 month period which ends between 1 October 2003 and 30 September 2004 (e.g. a financial year ending 31 December 2003).

From

To

Please indicate the period covered by this form

If the period covered by this form is not 12 months, please explain below

.....

.....

Part 2 – R&D carried out by this business

Note

- This part of the form seeks details of R&D carried out by this business on its own behalf or on behalf of others.

Including

- R&D carried out as a participant in any unincorporated joint venture, including participation in any unincorporated Cooperative Research Centre (CRC)
- R&D projects carried out on contract for other legal entities (such as other businesses or incorporated CRCs)
- Contracted out analytical work, engineering or other specialised services which are in support of R&D projects carried out by this business

Excluding

- R&D projects funded by this business but carried out by others using their own facilities
- Contributions to any incorporated CRC
- Provision of specialised services for other organisations' R&D projects

6 Did this business carry out any R&D during the year ended 30 June 2004?

No Go to Question 14

Yes

7 Report the person years of effort on R&D by this business for the year ended 30 June 2004 by the following categories

Note

- Report for all employees for whom this business paid a retainer, wage or salary.
- For the purpose of this survey, a person can only work one person year each year. For example, a full time employee spending 40% of his/her time on R&D during half of the survey year would contribute 0.4 persons x 0.5 years = 0.2 person years to the R&D effort, even if his/her average time per week were, say 60 hours. A part time employee working 40% of a full time week doing only R&D, would contribute 0.4 person years to the R&D effort.

(a) Researchers

Including

- Staff working on the conception and/or creation of new knowledge/products
- Executives and directors involved in the planning or management of scientific and technical aspects of R&D projects
- Software developers/programmers

Excluding

- Executives and directors concerned primarily with budgets and human resources, rather than project content [include in Question 7(d)]

Person years
(round to one decimal place)

(b) Technicians directly supporting R&D

Note

- Report persons doing technical tasks in support of R&D, normally under the direction and supervision of a researcher.
- Typical activities include preparation for experiments, taking records, preparation of charts and graphs and coding data.

Person years
(round to one decimal place)

(c) Other staff directly supporting R&D

Including

- Skilled and unskilled craftspersons
- Secretarial and clerical staff working on, or directly associated with, R&D activity

Excluding

- The proportion of the effort of administrative and general services personnel (e.g. cleaners, canteen workers) that indirectly supports R&D [include in Question 7(d)]

Person years
(round to one decimal place)

(d) Other staff providing indirect services to R&D

Note

- Report the part of the effort that is attributable to the indirect support of R&D, e.g. personnel officers, canteen staff, janitors whose work indirectly supports R&D.

Including

- Executives and directors concerned primarily with budgets and human resources, rather than project content

Person years
(round to one decimal place)

(e) Total

8 How much did this business spend on R&D for the year ended 30 June 2004 against the following categories?

(a) Capital expenditure

Note

- If the asset has been/will be used for more than one activity, include only an estimate of the portion used for R&D.

Including

- Expenditure on fixed assets used in the R&D projects of this business
- Acquisition of computer software expected to be used for more than one year
- Purchase of computer databases expected to be used for more than one year
- Capitalised computer software licence fees

Excluding

- Repair and maintenance expenses [include in Question 8(c)]
- Depreciation provisions
- Capitalised assets resulting from R&D projects (the component costs of these projects should be recorded in this question where appropriate)
- Software for own account produced as part of R&D [include in Question 8(c)]

(i) Land, buildings and other structures

\$, ,000

(ii) Vehicles, plant, machinery and equipment

\$, ,000

(b) Labour costs

Note

- Report wages, salaries and associated labour costs for the total person years of effort reported in Question 7.

Including

- Gross earnings before taxation and other deductions
- Overtime earnings, penalty payments and shift allowances
- Employer contributions into superannuation (including salary sacrifice)
- Fringe benefits tax and payroll tax
- Payments to contract staff on the payroll of this business
- Severance, terminations and redundancies
- Workers' compensation premiums/costs
- Provisions for employee entitlements
- Salaries and fees of directors and executives
- Retainers and commissions of persons who received a retainer
- Bonuses
- Annual and other types of leave

\$, ,000

9 Please provide a dissection of the R&D expenditure reported in Question 8 by the location(s) in which this business carried out R&D for the year ended 30 June 2004

(a) New South Wales	\$	<input type="text"/>	,	<input type="text"/>	,000
(b) Victoria	\$	<input type="text"/>	,	<input type="text"/>	,000
(c) Queensland	\$	<input type="text"/>	,	<input type="text"/>	,000
(d) South Australia	\$	<input type="text"/>	,	<input type="text"/>	,000
(e) Western Australia	\$	<input type="text"/>	,	<input type="text"/>	,000
(f) Tasmania	\$	<input type="text"/>	,	<input type="text"/>	,000
(g) Northern Territory	\$	<input type="text"/>	,	<input type="text"/>	,000
(h) Australian Capital Territory	\$	<input type="text"/>	,	<input type="text"/>	,000
(i) Australian External Territories	\$	<input type="text"/>	,	<input type="text"/>	,000
(j) Overseas	\$	<input type="text"/>	,	<input type="text"/>	,000
(k) Total (to agree with total in Question 8)	\$	<input type="text"/>	,	<input type="text"/>	,000

Sample

Part 3 – Classification of research

- 11 Please give a brief description of this business's R&D projects (e.g. software development, pharmaceutical production, waste disposal)**

.....

.....

- 12 Please classify this business's R&D projects to the most appropriate Research Fields, Courses and Disciplines (RFCD) code(s) (shown on pages 2 and 3 of the attachment) and express their associated expenditure as a percentage of total R&D expenditure**

Definition

- The **RFCD** classification is based primarily on recognised academic disciplines and evolving areas of study. It is used to describe the nature of the research being performed.

Note

- More than one RFCD code may be provided if relevant, together with an associated percentage split.
- A more detailed classification is provided on pages 4 to 10 of the attachment to assist you in selecting the most appropriate code(s).

code	%
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>

Please specify extra RFCD codes and percentage splits if there is not enough space above

.....

.....

Part 4 – Expected expenditure

14 How much is expected to be spent on R&D carried out by this business during the year ending 30 June 2005?

\$, ,000

Part 5 – Biotechnology R&D

15 Did this business carry out or pay another organisation to carry out R&D attributable to biotechnology during the year ended 30 June 2004?

Definition

• **Biotechnology** is the application of science and engineering principles to living organisms as well as parts, products and models thereof, to alter living or non-living materials for the production of knowledge, goods and services.

List of biotechnologies as an interpretive guideline:

- *DNA technology*: genomics, gene expression, pharmaco-genetics, gene probes, DNA sequencing/synthesis/amplification, genetic engineering, genetic marker technologies.
- *Proteins and molecules*: protein/peptide sequencing/synthesis, protein targeting, lipid/protein glyco engineering, proteomics, hormones and growth factors, cell receptors/signalling/pheromones.
- *Cell and tissue culture and engineering*: cell/tissue culture, tissue engineering, hybridisation, cellular fusion, vaccine/immune stimulants, embryo manipulation, assisted reproductive technologies.
- *Process biotechnologies*: bioreactors, fermentation, bioprocessing, bioleaching, bio-pulping, bio-bleaching, biodesulphurization, bioremediation, biofiltration, biomining.
- *Other biological processes*: gene therapy, viral vectors, bacterial vectors.

Whilst not a comprehensive list, the following specific activities should be noted as being within the scope of biotechnology:

- Bioinformatics
- Platform technologies
- Biomonitoring/biosensing
- Bioprospecting/biodiscovery
- Biological control (e.g. immunocontraception, biopesticides)
- Biological waste management technologies
- Marker assisted selection

No Go to Question 26

Yes

20 Please indicate the type of Australian organisations paid to carry out biotechnology related R&D

Tick all that apply

- (a) Universities or other higher education institutions
- (b) CSIRO
- (c) Other government or private non-profit research institute
- (d) Business:
 - Contract Research Organisation (CRO)
 - Other (please specify)

21 Please specify the overseas countries in which this business paid others to carry out biotechnology related R&D

Tick all that apply

- (a) USA
- (b) Canada
- (c) Singapore
- (d) India
- (e) Israel
- (f) Other (please specify)

22 Please specify why another organisation was paid to carry out the biotechnology related R&D activity

Tick all that apply

- (a) Lack of technical skill/expertise
- (b) Not core business
- (c) Cost effectiveness
- (d) To diversify risk (risk management)
- (e) Third party validation
- (f) Timeliness
- (g) Other (please specify)

23 Please classify this business’s biotechnology related R&D projects to the appropriate bio-industry sector(s) and express their associated expenditure as a percentage of total biotechnology R&D expenditure

Note

- More than one bio-industry sector may be selected if relevant, together with an associated percentage split.
- Percentage splits should be based on expenditure

	R&D performed by this business		Payments for R&D carried out by another organisation
	For own purposes	For another organisation	
(a) Human health	%	%	%
– Diagnostics (e.g. biosensors, gene probes, polymerase chain reaction amplification)	<input type="text"/>	<input type="text"/>	<input type="text"/>
– Therapeutics (e.g. biopharmaceuticals, vaccines, gene therapy)	<input type="text"/>	<input type="text"/>	<input type="text"/>
(b) Bioinformatics (e.g. databases on genomes, protein sequences; modelling complex biological processes)	<input type="text"/>	<input type="text"/>	<input type="text"/>
(c) Agricultural biotechnology			
– Plant (e.g. genetic markers, tissue culture, genetic engineering)	<input type="text"/>	<input type="text"/>	<input type="text"/>
– Animal (e.g. diagnostics, therapeutics, genetic markers, genetic engineering)	<input type="text"/>	<input type="text"/>	<input type="text"/>
– Aquaculture (e.g. broodstock genetics)	<input type="text"/>	<input type="text"/>	<input type="text"/>
(d) Industrial processing			
– Food processing (e.g. bioprocessing, functional foods/nutraceuticals)	<input type="text"/>	<input type="text"/>	<input type="text"/>
– Speciality chemicals (e.g. enzymes)	<input type="text"/>	<input type="text"/>	<input type="text"/>
– Other industrial activity (e.g. chemical feedstocks, commodity chemicals, lubricants, fuel, biopulping, biobleaching, plastics)	<input type="text"/>	<input type="text"/>	<input type="text"/>
(e) Natural resource recovery (e.g. microbiologically enhanced recovery, bioprocessing)			
– Energy	<input type="text"/>	<input type="text"/>	<input type="text"/>
– Minerals	<input type="text"/>	<input type="text"/>	<input type="text"/>
(f) Environment (e.g. bioremediation, biofiltration, diagnostics, waste management)	<input type="text"/>	<input type="text"/>	<input type="text"/>
(g) Other (please specify)	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>			
(h) Total	1 0 0	1 0 0	1 0 0

24 For the year ended 30 June 2004, please indicate any factors which adversely affected the advancement of biotechnology R&D undertaken by this business

Note

- Tick one box per row.

	Not applicable	No effect	Some effect	Severe effect
(a) Access to capital	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(b) Access to Intellectual Property (IP)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(c) Australian/foreign regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(d) Patent fees and approval processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(e) Access to suitably trained scientific/technical staff ...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(f) Australian taxation environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(g) Public acceptance and ethical considerations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(h) Access to grants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(i) Access to 'networks'	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(j) Access to specialist facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(k) Unsuccessful R&D	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(l) Other (please specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

25 For the year ended 30 June 2004, please indicate any factors which adversely affected the advancement of biotechnology product commercialisation undertaken by this business

Note

- Tick one box per row.

	Not applicable	No effect	Some effect	Severe effect
(a) Access to capital	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(b) Access to Intellectual Property (IP)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(c) Size of market	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(d) Australian/foreign regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(e) Access to international market	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(f) Patent fees and approval processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(g) Access to Contract Research Organisations (CROs)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(h) Access to manufacturing facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(i) Access to specialist infrastructure (e.g. toxicology testing)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(j) Product liability insurance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(k) Public acceptance and ethical considerations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(l) Lack of commercial management skills.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(m) Access to grants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(n) Access to 'networks'	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(o) Unsuccessful R&D	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(p) Other (please specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part 6 – Time taken and comments

26 If this business is the sole or major contributor to a statistical cell in this survey, do you consent to the release, within statistical tables, of the data?

Note

- Under the *Census and Statistics Act 1905* the name of your business would remain confidential.

No

Yes Please complete the enclosed **Instrument of Consent**

27 For the financial year reported, were there any unusual factors affecting R&D within this business? If so, please specify

Including

- Large increases or decreases from previously reported data
- Changes in reporting procedure
- Changes in your accounting period
- Company restructuring

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28 Please provide an estimate of the time taken to complete this form

Including

- The time actually spent reading the instructions, working on the questions and obtaining the information
- The time spent by all employees in collecting and providing this information

hrs

mins

29 Please provide comments

- on any of the information you have supplied on this form
- on any questions which caused problems
- if you would like to suggest improvements to this form

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Thank you for completing this form

